What is claimed is:

1. A driving control device for a motor having a plurality of multi-phase coils for generating a rotating magnetic field to cause a rotor to rotate, comprising:

a phase current measuring device for measuring a phase current or currents, among phase currents of the plurality of multi-phase coils, of a number in a range between one and a number smaller than a total number of the independent phase currents;

a control signal generating circuit for estimating a state of a motor by using the measured phase current or currents and a motor model or a model showing a state of the motor to generate a driving control signal based on an estimation result to be supplied to the motor,

wherein

each of the phase currents of the motor is controlled based on the driving control signal supplied from the control signal generating circuit.

2. A driving control device for a motor having a plurality of multi-phase coils for generating a rotating magnetic field to cause a rotor to rotate, comprising:

an addition phase current measuring device for measuring an addition phase current or currents of a number in a range between one and a number smaller than a total number of addition phase currents, the addition phase current being an addition of phase currents of at least two of the plurality of multi-phase coils; and

a control signal generating circuit for estimating a state

of a motor by using the measured addition phase current or currents and a motor model or a model showing a state of the motor to generate a driving control signal based on an estimation result to be supplied to the motor,

wherein

each of the phase currents of the motor is controlled based on the driving control signal supplied from the control signal generating circuit.

3. The device according to claim 2, further comprising:

a neutral point current measuring device for measuring a current flowing between neutral points of two of the plurality of multi-phase coils, the two multi-phase coils being connected to each other at respective neutral points,

wherein

the addition phase current measuring device measures at least two addition phase currents, and

the control signal generating circuits utilizes the measured neutral point current, the at least two measured addition phase currents, and a linear model as the motor model or the model showing a state of the motor.

4. The device according to claim 2, further comprising:

a neutral point current measuring device for measuring a current flowing between neutral points of two of the plurality of multi-phase coils, the two multi-phase coils being connected to each other at respective neutral points,

wherein

the control signal generating circuits utilizes the measured

neutral point current, the at least two measured addition phase currents, and a non-linear model as the motor model or the model showing a state of the motor.

5. The device according to claim 2, wherein at least two of the plurality of multi-phase coils are independent, the addition phase current measuring device measures at least two addition phase currents, and the control signal generating circuit utilizes a linear model as the motor model or the model showing a state of the motor.

6. The device according to claim 2, wherein at least two of the plurality of multi-phase coils are independent, and the control signal generating circuit utilizes a non-linear model as the motor model or the model showing a state of the motor.

7. The device according to claim 2, wherein the multi-phase coil is a three-phase coil.

8. The device according to claim 1, further comprising:

a neutral point current measuring device for measuring a current flowing between neutral points of two of the plurality of multi-phase coils, the two multi-phase coils being connected to each other at respective neutral points,

wherein

the control signal generating circuits utilizes the measured neutral point current, the at least two measured addition phase currents, and a non-linear model as the motor model or the model showing a state of the motor.

9. The device according to claim 1, wherein at least two of the plurality of multi-phase coils are independent, and the control signal generating circuit utilizes a non-linear model as the motor model or the model showing a state of the motor.

10. The device according to claim 1, wherein the multi-phase coil is a three-phase coil.